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Summary of Foliar Fungicide Applications on Corn in Iowa in 2018

Alison E. Robertson
Iowa State University, alisonr@iastate.edu

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Abstract
In 2018, we tested various foliar fungicides on corn at six locations in Iowa: ISU Northwest Research and Demonstration Farm (NWRF), Sutherland; Northeast Research and Demonstration Farm (NERF), Nashua; Northern Research and Demonstration Farm (NRF), Kanawha; Southwest Research and Demonstration Farm (SWRF), Lewis; Southeast Research and Demonstration Farm (SERF), Crawfordsville; and the Ag engineering and Agronomy Farm near Boone.

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In 2018, we tested various foliar fungicides on corn at six locations in Iowa: ISU Northwest Research and Demonstration Farm (NWRF), Sutherland; Northeast Research and Demonstration Farm (NERF), Nashua; Northern Research and Demonstration Farm (NRF), Kanawha; Southwest Research and Demonstration Farm (SWRF), Lewis; Southeast Research and Demonstration Farm (SERF), Crawfordsville; and the Ag engineering and Agronomy Farm near Boone.

As in years past, these trials were done to provide data to farmers to help determine if a foliar fungicide was necessary. Our objectives were 1) assess the effect of timing of application of fungicides on disease, 2) evaluate the yield response of hybrid corn to foliar fungicide application, and 3) discern differences, if any, between fungicide products.

Products used and application timings tested

In 2018, we tested six products at various application timings (Table 1). Timing of application varied by product, and was suggested by the companies providing each product. Fungicides were applied at growth stage V5, V12, and when the corn was flowering (VT-R1). This was the second year we tested applications at V12. No surfactant was included in applications made at V12.

Effect of product and timing on GLS

Gray leaf spot was prevalent at all locations. Minimal common rust and northern corn leaf blight was observed. Disease severity (percent of the canopy with GLS) was assessed at 4 of the 6 locations at dent. No disease assessments were done at NRF or SWRF. Mean disease severity among the four locations for each treatment is shown in Table 1. The most severe GLS was observed at SERF, where the mean GLS severity in the non-sprayed check was 69%. At NERF and NWRF, the mean GLS severity was 37% and 18%, respectively. At AEA, gray leaf was present at extremely low levels.

- All fungicides applied at either V12 or at R1 reduced GLS severity compared to the non-sprayed control ($P<0.1$).
- In general, applications made at VT-R1 reduced GLS more than applications made at V12 ($P<0.1$). This contrasts with data from 2017 when applications made at V12 were more effective at reducing GLS compared to applications made at R1.
- Two treatments consistently reduced GLS severity more than all other treatments evaluated at all four locations: Miravis Neo applied at VT-R1 and Revysol premix applied at VT-R1. Disease was reduced more than 90 percent compared to the non-sprayed control. Favorable weather for GLS (warm, high relative humidity and frequent precipitation) occurred throughout the grainfill period, thus these data suggest these products have a longer effective period than other products tested.

Table 1. Effect of foliar fungicide products applied at different growth stages on mean percent gray leaf spot (GLS) severity and yield averaged across 4 locations in Iowa in 2018 *Gray leaf spot severity means followed by the same letter are not statistically different from each other, P<0.1. In other words, there is a 90% probability that those treatments were equally effective against GLS. **Before analysis, data were transformed

Delaro, 4 fl. oz	
Application timing	V5
Mean GLS severity (backtransformed means**)	15.3 a
Mean yield	237.3
Aproach Prima, 6.8 fl oz	
Application timing	V12

Mean GLS severity (backtransformed means**)	8.7 b
Mean yield	240.3
Delaro, 8 fl. oz, V5	
Application timing	V12
Mean GLS severity (backtransformed means**)	8.4 b
Mean yield	243.9
Miravis Neo, 13.7 fl oz	
Application timing	V12
Mean GLS severity (backtransformed means**)	3.8 d
Mean yield	242.6
Priaxor, 4 fl. oz	
Application timing	V12
Mean GLS severity (backtransformed means**)	6.1 bc
Mean yield	241.0

Topguard EC, 5 fl oz	
Application timing	V12
Mean GLS severity (backtransformed means**)	7.2 b
Mean yield	238.1
Aproach Prima, 6.8 fl oz	
Application timing	R1
Mean GLS severity (backtransformed means**)	8.1 b
Mean yield	238.7
Revysol premix, 7 fl oz	
Application timing	R1
Mean GLS severity (backtransformed means**)	2.0 e
Mean yield	243.2
Delaro, 8 fl. oz	

Application timing	R1
Mean GLS severity (backtransformed means**)	4.2 cd
Mean yield	246.6
Miravis Neo, 13.7 fl oz	
Application timing	R1
Mean GLS severity (backtransformed means**)	2.1 e
Mean yield	244.6
Topguard EC, 5 fl oz	
Application timing	R1
Mean GLS severity (backtransformed means**)	4.6 cd
Mean yield	232.9
Non-treated check	
Application timing	-
Mean GLS severity (backtransformed means**)	15.3 a

Mean yield	238.1
P-value	
Application timing	
Mean GLS severity (backtransformed means**)	<0.0001
Mean yield	0.2469

Effect of product and timing on GLS

Yields among the trials were excellent. Yield of the non-sprayed check was 227 bu/A at SERF, 244 bu/A at AEA, 237 at NERF and 241 bu/A at NWRF. The yield of each treatment was averaged across four locations (SERF, AEA, NERF and NWRF).

No effect of fungicide was detected on yield among location (P>0.1) (Table 1).

Management recommendations

All fungicides were effective against gray leaf spot. The newer chemistries appeared superior to older chemistries especially when disease was severe. Applications made at tasseling were more effective than those made earlier in the growing season. To limit resistance to fungicide chemistries developing, an integrated method of disease management should be used including growing disease-resistant hybrids in fields with a history of disease.

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Category: Plant Diseases

Crop:

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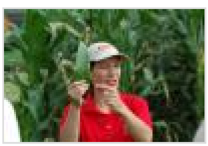
Author:

Alison Robertson *Professor of Plant Pathology and Microbiology*



Dr. Alison Robertson is an associate professor of plant pathology and microbiology. She provides extension education on the diagnosis and management of corn and soybean diseases. Her research interests include Pythium seedling disease of corn and soybean and Goss's wilt. Dr. Robertson receiv...